24 Ports NWay Switching Hub

User's Guide

V2.0

FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limitations are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if no installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into a different outlet from that the receiver is connected.
- Consult your local distributors or an experienced radio/TV technician for help.
- Shielded interface cables must be used in order to comply with emission limits.

Changes or modifications to the equipment, which are not approved by the party responsible for compliance could affect the user's authority to operate the equipment.

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5. Product Specifications

1. Unpacking Information

Thank you for purchasing the 24-port NWay switch. Before you start, please check all the contents of this package.

The product package should include the following:

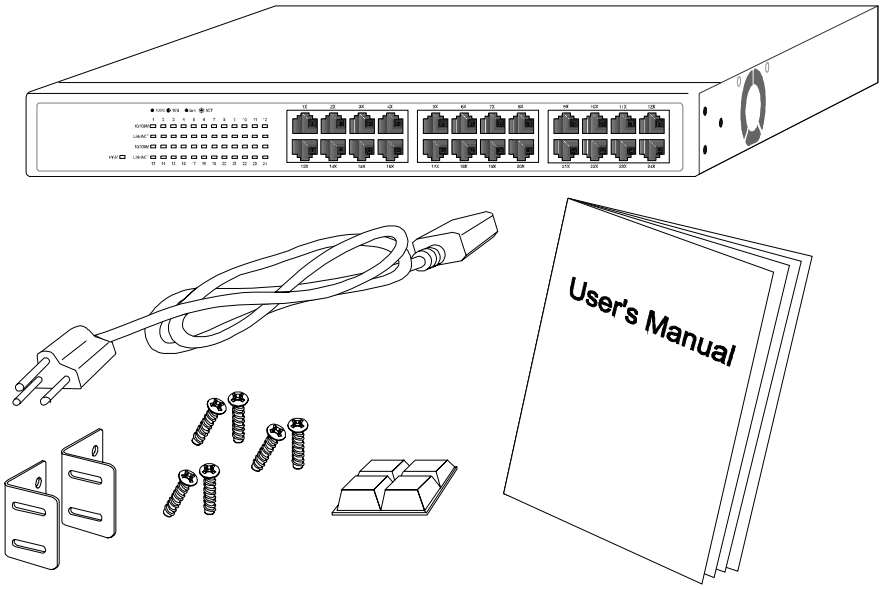
1. One 24-port NWay switch

2. One power cord

3. Rubber foot

4. Rack-mount brackets and screws

5. User's guide



2. Introduction To 24 Port NWay Switch

2.1 General Description

The device is a powerful, high-performance Fast Ethernet switching hub, with all 24 ports capable of 10 or 100Mbps auto-negotiation operation (NWay) which means the switch could automatically negotiate with the connected partners on the network speed and duplex mode. It is ideal for micro-segmenting large networks into smaller, connected subnets for improved performance, enabling the bandwidth demanding multimedia and imaging applications. Moreover, the 10/100Mbps auto-sensing ability provides an easy way to migrate 10Mbps to 100Mbps networks with no pain. Compared to the shared 10Mbps or 100Mbps networks, the switching hub delivers a dedicated 10/100Mbps connection to every attached client with no bandwidth congestion issue.

Store-and-forward switching mode promises the low latency plus eliminates all the network errors, including runt and CRC error packets. To work under full-duplex mode, transmission and reception of the frames can occur simultaneously without causing collisions as well as double the network bandwidth.

The switching hub is plug-n-play without any software to configure and also fully compliant with all kinds of network protocols. Moreover, the rich diagnostic LEDs on the front-panel can provide the operating status of individual port and whole system.

For network connection:

The switching hub can use the following types of cabling:

- 10BASE-T Category 3, 4 or 5 UTP/STP
- 100BASE-TX Category 5 UTP/STP

Category 5 cable is preferred to be using with this product in structured wiring environments. This will ensure correct operation of all ports at 10Mbps or 100Mbps.

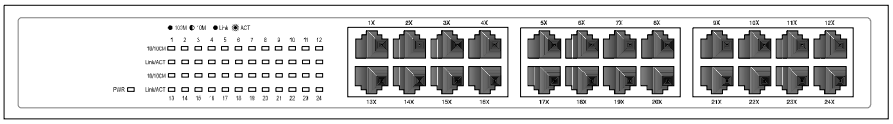
2.2 Key Features

The switch provides the following key features:

- Complies with 10BASE-T specifications of the IEEE802.3 standard
- Complies with 100BASE-TX specifications of the IEEE802.3u standard
- Twenty-four RJ-45 ports for 100Base-TX and 10Base-T connectivity
- Every switching port is automatically cross-over detection (MDI, MDI-X auto-detected)
- Supports full and half duplex operation on all ports
- Wire-speed packet filtering and forwarding rate
- Store-and-forward architecture filters fragment & CRC error packets
- Supports 4K MAC address entries in whole system
- 768K Bytes buffer memory
- Supports extensive LED indicators for network diagnostics
- Internal universal switching power supply (100 ~ 240VAC)
- FCC Class A, CE

2.3 The Front Panel

The front panel of the switching hub is shown as below.



The auto-negotiation feature of the switching hub allows each port of the device running at one of the following four operation modes:

1. 100Mbps full-duplex
2. 100Mbps half-duplex
3. 10Mbps full-duplex
4. 10Mbps half-duplex

Every port is automatically cross-over detection that could allow the switch connect to PC or switch without cable consideration.

The rich diagnostic LEDs on the front-panel can provide the operating status of individual port and whole system. The following table is a summary for LEDs definition.

Type	LED	Status	Operation
System	Power	Green	Power is on
		Off	Power is off
Port LEDs	10/100M	Green	Connected as 100Mbps
		Off	Connected as 10Mbps
	Link/Act	Green	The port is connected
		Blinking Green	There is traffic transverses the port
		Off	No connection

2.3.1 System LEDs

System LED indicators are located on the front panel for showing the operating status of the whole device.

2.3.1.1 Power LED

This indicator lights green when the hub is receiving power; otherwise, it is off.

2.3.2 Port LEDs

Port LED indicators are located on the front panel for showing the operating status of each port.

2.3.2.1 Speed LED

Every port has a Speed LED for showing the speed of network connection. Steady green indicates that the port is operating at 100Mbps. If the LED is off, the link speed is 10Mbps.

2.3.2.2 Link/Act LED

Every port has a Link/Activity LED. Steady light (link state) indicated that the port has good linkage to its associated device. Flashing green indicates there is traffic transverses the port.

If the port is connected but the Link/Activity LED is dark, check the following items:

1. The switching hub and the connected device's power are on or not.
2. The port's cable is firmly seated in its connectors in the switching hub and in the associated device.
3. The connecting cable is good and with correct type
4. The connecting device, including any network adapter is functioning.

2.4 The Rear Panel

The standard rear panel of the hub is shown below (AC Input 100 ~ 240V)

2.4.1 Power Connecting

For compatibility with electric service in most areas of the world, the switching hub's power supply automatically adjusts to line power in the range 100~240 VAC and 50~60 Hz.

Plug the female end of the power cord firmly into the receptacle on the rear panel of the switching hub. Plug the other end of the power cord into an electric service outlet then the power will be ready.

3. Installing And Using 24 Port NWay Switch

3.1 Installing The 24 Port NWay Switch

The hub does not require software configuration. Users can immediately use any of the features of this product simply by attaching the cables and turning the power on.

3.1.1 Desktop Installation

Locate the switching hub on the desktop and place the hub on a clean, flat desk or table close to a power outlet. Plug in all network connections and the power cord, then the system is ready.

When deciding where to put the switching hub, you must ensure:

- It is accessible and cables can be connected easily.
- Cabling is away from:
  Sources of electrical noise such as radios, transmitters and broadband amplifiers power lines and fluorescent lighting fixtures.
- Water or moisture can not enter the unit.
- Air flow around the unit and through the vents in the side of the case is not restricted (company recommend that you provide a minimum of 25mm inch clearance)

To prolong the operational life of your units:

- Never stack units more than eight high if freestanding.
- Do not place objects on top of any unit or stack
- Do not obstruct any vents at the sides of the case

3.1.2 Rack-Mount Installation (Rack-mount kit is optional)

The switching hub may standalone, or may be mounted in a standard 19-inch equipment rack. Rack mounting produces an orderly installation when you have a number of related network devices. The switching hub is supplied with two optional rack mounting brackets and screws. These are used for rack mounting the unit.

Rack Mounting the Switch
The switching hub should be able to fit in the 19 inch rack.

1. Disconnect all cables from the switching hub before continuing.
2. Place the unit the right way up on a hard, flat surface with the front facing toward you.
3. Locate a mounting bracket over the mounting holes on one side of the unit.
4. Insert the screws and fully tighten with a suitable screwdriver.
5. Repeat the two previous steps for the other side of the unit.
6. Insert the unit into the 19" rack and secure with suitable screws (not provided).
7. Reconnect all cables.

3.1.3 Installing Network Cables

After placing the hub on the desktop, we need to know how to connect the device to network.

3.1.3.1 Station Connections with Twisted-Pair Cable

Connect each station to the hub by a twisted-pair straight cable (10BASE-T or 100BASE-T cables). Plug one RJ-45 connector into a front-panel port of the hub, and plug the other RJ-45 connector into the station's network adapter.

3.1.3.2 Switch to Switch Connections with Twisted-Pair Cable

In making a switch to switch connection, you just need to use normal straight cable because of each switching port is automatically cross-over detection.

4. Switch Operation

4.1 MAC Address Table and Learning

The switching hub is implemented with a MAC address table which is composed of many entries. Each entry is used to store the address information of network nodes on the network, including MAC address, port ID, etc. The information is the most important base to do packet filtering and forwarding.

When one packet comes in from any port, the switching hub will learn the source address, port ID, and the other related information in address table. Therefore, the content of the MAC table will update dynamically.

4.2 Filtering and Forwarding

When one packet comes in from any port of the switching hub, it will check the destination address besides the source address learning. The hub will look up the address table for the destination address. If not found, this packet will be forwarded to all the other ports except the port which this packet comes in. If found, and the destination address is located at different port from this packet comes in, the packet will be forwarded to the port where this destination address is located according to the information of address table. But, if the destination address is located at the same port as this packet comes in then this packet will be filtered.

4.3 Store and Forward

Store-and-forward is one kind of packet-forwarding methodology. As a store-and-forward switching hub, it will store the complete packet in the internal buffer and do the complete error checking before transmitting to the network. Therefore, no error packets will disturb the network. It is the best choice when a network needs efficiency and stability.

5. Product Specifications

Standard	IEEE802.3, 10BASE-T IEEE802.3u, 100BASE-TX
Interface	RJ-45 x 24 NWay switching ports (Support automatic crossover MDI)
Cable Connections	RJ-45 (10BASE-T) : UTP Category 3,4,5 RJ-45 (100BASE-TX) : UTP Category 5
Network Data Rate	Auto-negotiation (10Mbps, 100Mbps)
Transmission Mode	Auto-negotiation (Full-duplex, Half-duplex)
LED indications	System Power x1 Port Speed Link/Activity
System Buffer Memory	768K byte
MAC Address Table	4K entries
Filtering/Forwarding Rate	10Mbps: 14,880pps/14,880pps 100Mbps: 148,800pps/148,800pps
Emission	FCC Class A, CE
Operating Temperature	0^0 ~ 50^0C (32^0 ~ 122^0F)
Operating Humidity	10% - 90%
Power Supply	100~240VAC, 50~60Hz